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SOURCE As indicated

PROGRESS REPORT ON KUYBYSHEV HYDROELECTRIC CENTER

[Numbers in Parentheses refer to appended sources.]

Leading Personnel

The following persons are identified with the construction of the
 Kuybyshev Hydroelectric Center

"Kuybyshevgidrostroy" Administration

Razin, N. V. --chief engineer (1)

Levanchuk, Sergey Dmitriyevich --chief of construction of the lower locks (2)

Myznikov --chief of right-bank concreting operations

Poletayev --chief engineer of right-bank concreting operations (3)

Rezhnikov --chief of right-bank hydraulic engineering region (4)

Shchelkanov, V. I. --chief of technical division (5)

Installation Administration of the "Soyuzprommekhanizatsiya" Trust (Trust for
 the Designing, Installation, and Production of Equipment for Intra-Plant Trans-
 portation, Mobile Cableways, and Cable Cranes) (6)

Dneprovskiy --chief (7)

Administration of "Stroymekhmontazh," Ministry of Transport and Heavy Machine
 Building USSR (3)

Lazarenko --chief (7)

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Layout of Construction Project

The project is divided into two construction areas, one on the left bank of the Volga and the other on the right bank. These areas are, in turn, divided into hydraulic engineering regions and industrial regions. In addition, there are a number of independent enterprises. Dispersed over the entire construction project are material and technical supply bases (two central bases and several smaller ones), motor transport offices, offices for computing data on the operation of machinery and machines, and bases belonging to the woodworking combine.(8)

Locks Scheduled for Completion in 1954

In 1954 construction of the navigable canal and locks of the Kuybyshev Hydroelectric Center must be completed so that ships may pass through them at the beginning of the 1955 navigation season.(9) According to Sergey Dmitriyevich Levanchuk, chief of construction of the lower locks, this will be the first structure of the Kuybyshev Hydroelectric Center to go into operation and must be completed a year earlier than the hydroelectric center as a whole. Levanchuk stated that the builders will be able to dam the Volga completely only after the navigable canal is in operation. The locks, he said, would be ready for Volga shipping in August 1954.(2)

MANUFACTURE AND INSTALLATION OF HYDROAGGREGATES

In the second half of 1954, installation of the hydroturbines must begin.(3) When the GES is entirely completed there are to be 20 hydroaggregates, each with a capacity of 100,000 kilowatts, in operation. In all, more than 70,000 tons of electrical machinery and equipment will be installed.(10) According to I. V. Komzin, chief of "Kuybyshevgidrostroy," concrete work for the first six aggregates of the power station [probably the first phase of the GES to go into operation] was started in August 1953.(11)

First Two Hydrogenerators Completed

Production of the first hydrogenerator for the Kuybyshevskaya GES was completed 31 December 1953 at the "Elektrosila" Plant imeni S. M. Kirov in Leningrad. According to A. S. Yermeyev, chief of the plant's hydrogenerator design bureau, it has a maximum capacity of 120,000 kilowatts.(12) The rated capacity is 105,000 kilowatts.(13)

The generator weighs 1,600 tons and the housing measures 17 meters in diameter. The ratio of metal per kilowatt of capacity in this generator is 25 percent less than in previously produced generators with a comparable number of revolutions.(14) When assembled the hydrogenerator is as high as an 8- or 9-story building and occupies a foundation area of about 300 square meters. The rotor will exert a pressure of 3,500 tons on the footstep bearing of the machine.

The "Elektrosila" Plant produced the hydrogenerator in 2 1/2 months.(13) It was estimated that about 100 railroad cars (14), including 80 flatcars, each with a capacity of 20 tons, would be required to transport the assembly and parts to the site of the Kuybyshevskaya GES.(12)

The "Elektrosila" Plant had completed the second hydrogenerator for the Kuybyshevskaya GES by 4 March 1954.(15)

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CONFIDENTIALFirst Hydroturbine Completed

On 13 March 1954, the Metal Plant imeni Stalin in Leningrad completed the first hydroturbine for the Kuybyshevskaya GES. Maximum capacity is rated at 126,000 kilowatts. Previously, the largest and most powerful hydroaggregates with adjustable pitch blades were those at the Shcherbakovskaya GES on the Volga. The dimensions of the aggregates for the Kuybyshevskaya GES are slightly larger than those of the aggregates at the Shcherbakovskaya GES, while the capacity is almost twice as much.(16)

Parts Manufactured for Other Aggregates

On 31 August 1953, the Novo-Kramatorskiy Plant imeni Stalin completed casting its tenth and last stator for the Kuybyshevskaya GES. With this, the plant completed the order for casting stators a half year ahead of schedule.(17)

On 12 April 1954, parts for the fourth aggregate were shipped from Kramatorsk to the Leningrad Metal Plant imeni Stalin. A 120-ton frame was required to transport the shaft of the hydroturbine. In all, 50 cars were required to transport the parts.(18)

EARTHWORK

The volume of earthwork in construction of the Kuybyshev Hydroelectric Center is expected to total about 165 million cubic meters.(19) As of 10 August 1954, over 30 million cubic meters had been completed.(20) In 1953, "Kuybyshev-gidrostroy" completed 25 million cubic meters of earthwork, including 8.5 million at the site of the GES building and 7 million at the site of the reinforced concrete spillway dam. In 1954, the volume of earthwork is to increase to 35 million cubic meters.(9) As of December 1953, the average cost for an excavator to remove one cubic meter of earth was calculated to be 3 rubles.(21) Almost 50 million cubic meters of earthwork had to be completed before concreting could start.(3)

The Right-Bank Construction Area

The construction site of the GES building measures several square kilometers and is located on the right bank of the Volga. The cofferdam surrounding the construction site is in the shape of a horseshoe, projecting about 400 meters into the river. The cofferdam is more than 200 meters thick at the base and 40 meters at the crest.(22) In August 1953, a million cubic meters of earth still remained to be removed from the construction site.(23) In September 1953, concreting and earth removal were going on simultaneously.(24) In early December 1953 earthwork in the excavation had been virtually completed.(25)

The Left-Bank Construction Area

The left-bank cofferdam, which is 12 kilometers long and surrounds the construction sites of the spillway dam and the navigable locks, cuts across the river valley of the Volga.(7) The navigable canal, boasting upper and lower locks, was under construction in July 1953. In places, the canal, which will be 6 kilometers long, had been dug to a width of 100 meters.(26)

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Earth removal at the construction site of the [lower] locks had been completed by early July 1953.(7) In August, many millions of cubic meters of earth still remained to be removed from the construction sites of the upper locks and the spillway dam.(23)

Earthen Dams

By 24 July 1953, construction of the main earthen dam had begun.(10) This dam will span the channel of the Volga, abutting the GES building on the right bank and the reinforced concrete spillway dam on the left bank (27), approximately in the center of Telyachiy Island.(28) This earthen dam will be nearly 37 meters high (29) and is expected to raise the level of the Volga 26 meters.(27) About 30 million cubic meters of earth are to be deposited in the main earthen dam.(28)

Following winter repair, six suction dredges were at work on 15 April 1954 depositing alluvium in the river-valley earthen dam.(30) This earthen dam, together with the main earthen dam, which will be 2.7 kilometers long (27), and the reinforced concrete spillway dam, which will be 1.5 kilometers long, will complete the 6 kilometers of dam across the channel and river valley of the Volga.(31)

CONCRETING

In all, more than 7 million cubic meters of concrete and reinforced concrete are to be placed in the Kuybyshev Hydroelectric Center.(19) In September 1953, after about 3 years of construction, approximately 200,000 cubic meters of concrete had been placed.(32) During the winter of 1953-1954 about 200,000 cubic meters of reinforced concrete were placed in the GES building, the lower navigable locks, and the spillway dam.(4)

Before the end of 1954, 2.1 million cubic meters of reinforced concrete must be placed in the GES building, the upper and lower navigable locks, and the spillway dam. In the first half of 1954, 8,000 cubic meters of concrete per day are scheduled to be placed; in the second half of the year this amount is to increase to 15,000 cubic meters per day.(3) In the second quarter of 1954, a total of 480,000 cubic meters and in the third quarter 770,000 cubic meters of reinforced concrete must be placed.(4)

The Right-Bank Construction Area

A total of 2.7 million cubic meters of concrete is to be placed in the GES building (33), which will be 800 meters long and 600 meters wide.(22) The first concrete was placed in the foundation slab of the GES building on 31 July 1953.(34) This slab, a reinforced concrete structure 6-7 meters thick, must support the weight of the power station with all its equipment and also withstand the pressure of the tremendous volume of water in the future reservoir.(23) By April 1954, concreting of the last section of the foundation slab was about to start.(30) In 1954, more than one million cubic meters of concrete must be placed in the GES building.(3)

In March 1954, the second phase of the right-bank concrete-mixing plant was in operation. This combine was expected to produce 8,000 cubic meters of concrete per day.(35) In April 1954, the "Stal'montazh" Trust, Moscow (23), had nearly completed a trestle bridge stretching for almost a kilometer over the excavation for the GES building at a height of about 40 meters.(4) Installation of the trestle, which will subsequently serve as the metal framework for the GES building (36), began in the excavation for the GES

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building on 17 August 1953 and was to have been completed by 7 November 1953.(37) Railroad cars will supply concrete, steel reinforcements, and metal constructions to the construction site via this 3-track trestle bridge.(38)

The Left-Bank Construction Area

In all, about 600,000 cubic meters of concrete are to be placed in the lower navigable locks.(2) In 1953, 220,000 cubic meters of concrete, as against a planned 180,000 cubic meters, were placed in this structure.(3) In April 1954, concrete was being placed in the walls of the lower locks.(30)

A total of 2.5 million cubic meters of concrete will be placed in the reinforced concrete spillway dam (9), which will be 20 meters high and 1.5 kilometers long.(31) The first concrete was placed in the foundation pit of the spillway dam on 16 November 1953.(39) In 1954, 600,000 cubic meters of concrete are to be placed in the spillway dam.(35) Here, as in the excavation for the GES building, concrete will be supplied via a trestlework bridge.(9)

OTHER INSTALLATIONS AND ACTIVITIES

For the construction of the Kuybyshev Hydroelectric Center about 17 million cubic meters of rock, crushed stone, sand, and gravel must be extracted, processed, and delivered to the construction areas and to the concrete plants.(40) About 5 million cubic meters of crushed stone and about 3 million cubic meters of gravel will be needed by the concrete-mixing plants; about 2 million cubic meters of stone must be placed in the spillway and earthen dams. These materials have to be transported across the construction areas, from one bank of the Volga to the other. To transport these and other construction materials, a cableway linking the left- and right-bank construction areas was designed by the Central Planning and Design Division of the "Soyuzprommekhanizatsiya" Trust.(6)

Cableway Across the Volga

The cableway across the Volga was to have gone into operation in October 1953.(41) Installation of the cableway was finally completed around 1 May 1954.(42) The cableway was built by a special installation administration of the "Soyuzprommekhanizatsiya" Trust which is responsible for installing all the large hoist and transport machinery at the construction project.(6)

The installation of more than 130 metal towers, each 25 meters high, and one metal tower in the middle of the Volga, 70 meters high, had been completed by 12 April 1954. After this, steel cables were to be stretched across the Volga.(4) Protective nets were to be placed under the cables wherever the cableway crossed construction sites, railroads, highways, and crane routes, as well as above the Volga as protection for passing ships. The cars are to be automatically tripped at all points where they unload.(6)

Each hour, 540 tons of construction materials are to be transported from one bank to the other.(4) By the second half of 1954, 2,500 carloads of cement, crushed stone, sand, and gravel are to be delivered to concrete-mixing plants every 24 hours.(3)

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CONFIDENTIALPreparations for 1954 Spring Floodwaters

In the spring of 1954, the rate of the Volga current at the cofferdam surrounding the excavation for the GES building was 2 meters per second. The pressure of the Volga floodwaters was expected to be one and a half to two times greater than in the spring of 1953 (4), when the water level of the Volga River rose 9 meters. (22) Rezhnikov, chief of the right-bank hydraulic engineering region, explained that the anticipated increase in pressure was based on the fact that the planned depth in the excavation for the GES building had been reached. The cofferdam was expected to withstand the pressure of a column of water measuring almost 38 meters. It had been discovered that the current was making hollows near the cofferdam. To fill these hollows 30,000 cubic meters of rock had been dumped on the bottom. It was estimated that, when the spring floodwaters came, a total of 1.3 million cubic meters of ground waters would be pumped from excavations into the Volga every 24 hours. (4)

Work on the Kuybyshev Reservoir

In November 1953, 11 special timber managements were at work in Ul'yanskaya Oblast clearing wood and brush from the area to be inundated by the future Kuybyshev Reservoir ("Kuybyshevskoye More"). (43) In May 1954, work was under way in the region of the Cheremshan River, near the city of Melekess. (44) The Melekesskiy Special Timber Management and the Nikol'skiy Timber Management, both of the "Vlgostandartdom" Trust, were at work clearing timber and brush. (45) The timber which was cut was being shipped to areas in Kuybyshevskaya and Ul'yanskaya Oblasts for building homes for those moved from the zone of the future reservoir. (44)

A series of dikes was under construction at Kazan' in November 1953 with the object of protecting the city from the waters of the future reservoir. (46)

Cities

Among the towns and villages which have sprung up near the construction project are Zhigulevsk, Komsomol'skiy (47) (also referred to as Komsomol'sk-on-Volga (31)) Novyy Stavropol', Shlyuzovoy, Portovyy (47) (also referred to as Portovyy Gorodok (3) and Portgorod (23)), and Morkvashi. In 3 years more than 330,000 square meters of space in residential and public buildings have been put in use. (3)

Zhigulevsk, in which both oil workers and construction workers live, is situated near the right-bank construction area. A railroad connecting Zhigulevsk and Syzran' station was built during the first winter of construction. (31) In 1953, Zhigulevsk was to add to the 30 stores, 9 dining halls, several schools and libraries, and 2 hospitals which already existed, 2 more hospitals, an intermediate school, and a railroad passenger station.

Komsomol'skiy is located in the pine forests which cover the low hills on the left bank of the Volga. (47) It has grown from a village into a city although it has not yet been officially recognized as such. (31) An asphalt highway connects Komsomol'skiy with a town which, in September 1953, was called Novyy Stavropol'. This city is located near the bank of the future Kuybyshev Reservoir, between two tremendous forests. Although not yet a year old in September 1953, it boasted over 1,000 residential buildings and many public buildings. Novyy Stavropol' will be one of the largest industrial centers of the middle Volga region. (47) Meanwhile, the old Volga town of Stavropol' was being evacuated in 1953, since it lies within the area which will be inundated by the Kuybyshev Reservoir. (23)

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In 1953, 1,900 workers in various trades were to be detached from work and trained at the training combine established at the construction project. Previously, 1,500 persons had completed training courses at the combine to become excavator operators, electric welders, etc. In addition, 7,372 persons had continued working while receiving training as masons, carpenters, and tractor operators.(48) In December 1953, "Kuybyshevgidrostroy" advertised in a Moscow newspaper for qualified engineers, foremen, technicians, specialists, accountants, and skilled workers. Applicants were to send papers to the Personnel Division of Kuybyshevgidrostroy, Stavropol', Kuybyshevskaya Oblast.(49)

CRITICISMS OF PROGRESS IN CONSTRUCTION

Commenting on the progress of construction in July 1953, N. Razin, chief engineer of "Kuybyshevgidrostroy," complained that assembly and installation work was not going as fast as it should, particularly in regard to the concrete-mixing plants, which were being erected by "Stroymekhmontazh." The three concrete-mixing plants which had gone into operation had many defects and stoppages were occurring. Placement of concrete in the GES building was dependent on early delivery of intake pipes and other foundation parts of the first hydroaggregates, but deliveries were not forthcoming.

The plants supplying steel for reinforcements were sending steel of an inferior quality which often arrived in a bent condition. The ends of the steel bars were not properly finished. This necessitated additional work before they could be butt-welded. The Ministry of Construction Materials Industry USSR was singled out for permitting shipment of cement which did not conform to technical specifications. Defective machinery, some of which had not even passed factory tests, had been sent.(7)

Another complaint was that accounting and calculating work was being done manually except for a few sites where there were calculating machines. As a result, a large number of people was required to perform this work. Nevertheless, accounting had fallen behind and data needed for operating were far from complete.(8)

In January 1954, the performance of the concrete plants was again criticized. The right-bank concrete plant, which was supposed to operate continuously, stood idle for 350 hours in December 1953. The quality of the concrete did not always meet technical standards.

The system of administration on the construction sites was described as cumbersome; the chief of the section was often not the real boss and his rights were extremely limited. An acute shortage of skilled personnel was felt on the construction sites as a result of the large number of specialists who were assigned to jobs in the divisions and administrations. The heads of "Kuybyshevgidrostroy" were charged with often substituting meetings and conferences for vital, practical guidance and day-to-day help for the construction areas which they rarely visited. Engineering and technical personnel were often required to attend long conferences and were thus kept away from work at the construction sites. The heads of the Administration for Construction of Volga Hydroelectric Power Stations, Ministry of Electric Power Stations and Electrical Industry USSR, were not well acquainted with the needs of the construction project and tended to form judgments solely on the basis of resumes and percentages, exercising lax control over the progress of construction and the enforcement of economy.(3)

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In April 1954, criticisms about the progress of concreting were again voiced. The planned capacity of the concrete plants had still not been realized and the construction sites had not been adequately prepared for concreting. In the first quarter of 1954, concreting lagged far behind the norms and the quota for the placement of concrete was not fulfilled.(4)

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